

WHAT IS CLAIMED IS:

- 1 1. A disconnection detecting circuit for a sensor apparatus, comprising a
2 control circuit and a sensor circuit including a functional circuit having one or a
3 plurality of transistors for outputting a sensor signal to said control circuit upon
4 receipt of power supply from said control circuit in a state where a plurality of
5 connection lines and terminals are interposed between said control circuit and said
6 sensor circuit, with said disconnection detecting circuit being made to detect a
7 disconnection of at least one of said connection lines,
8 wherein, in a normal operation, an energizing current is supplied directly
9 from said control circuit through said terminal to a collector or drain of said
10 transistor in the sensor circuit side, and
11 in response to the occurrence of a disconnection of said connection line, an
12 impedance in the sensor circuit side is set to be higher than an impedance in the
13 control circuit side.
- 1 2. The circuit according to claim 1, further comprising reverse current
2 checking means for checking a reverse current in said transistor of said functional
3 circuit at the occurrence of the disconnection of said connection line.
- 1 3. The circuit according to claim 2, wherein said functional circuit has one or
2 a plurality of amplification circuits and said amplification circuit includes an
3 output side amplification circuit for carrying out inputting and outputting of a
4 direct-current signal from an output terminal of said sensor circuit through said
5 connection line, and
6 said reverse current checking means is made to check the reverse current
7 in said transistor of said output side amplification circuit at the occurrence of the
8 disconnection of said connection line.

1 4. The circuit according to claim 3, wherein said amplification circuit is
2 driven upon receipt of the supply of a current from a constant-current circuit, and
3 said output side amplification circuit is equipped with an output current source
4 arranged in the form of a current mirror circuit, said constant-current circuit is
5 made to supply a current to said output current source and is provided separately
6 from a constant-current circuit for supplying a current to an amplification circuit
7 other than said output side amplification circuit.

1 5. The circuit according to claim 2, wherein said transistor is a PNP bipolar
2 transistor, and a collector of said PNP bipolar transistor is connected to a power
3 supply bus side producing a lower side reference electric potential in an operation
4 of said functional circuit, and said reverse current checking means is interposed
5 between said collector of said PNP bipolar transistor and said power supply bus
6 having said lower side reference electric potential to check a reverse current in
7 said PNP bipolar transistor.

1 6. The circuit according to claim 1, wherein said functional circuit includes
2 an amplification circuit having said one or plurality of transistors, and a current
3 control circuit is provided to cut off an operational current for said amplification
4 circuit at the occurrence of the disconnection of said connection line.

1 7. The circuit according to claim 6, wherein said amplification circuit
2 includes an output side amplification circuit for carrying out inputting/outputting
3 of a direct-current signal from a terminal of said sensor circuit through said
4 connection line, and said current control circuit cuts off an operational current for
5 said output side amplification circuit at the occurrence of the disconnection of said
6 connection line.

1 8. The circuit according to claim 6, wherein said current control circuit is
2 constructed with a current mirror circuit including a first transistor to which a
3 current is inputted from a power supply bus of said sensor circuit and a second
4 transistor whose first and second transistor control terminals are connected to each
5 other, and a resistance element is connected between said power supply bus of
6 said sensor circuit and said transistor control terminals.

1 9. The circuit according to claim 1, wherein said transistor is a bipolar
2 transistor, and a current checking means is provided to check the supply of a base
3 current to said bipolar transistor at the occurrence of the disconnection of said
4 connection line.

1 10. The circuit according to claim 2, wherein said reverse current checking
2 means is constructed by reverse-connecting a diode or a diode-connected
3 transistor.

1 11. The circuit according to claim 9, wherein said current checking means is
2 constructed by reverse-connecting a diode or a diode-connected transistor.